ARGUMENTS

DISPOSITION OF THE CLAIMS

Claims 1-36 are pending in the application

Of the above claims, claim 28 is withdrawn from consideration. Claims 1-27 and 29-36 are rejected.

ARGUMENTS

Claims rejections- 35USC §103

Claims 1-5, 21-25, 27, 29-32 and 35-36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng et al. (2004/0035854) (as evidenced by Suganthan et al.) in view of the newly cited reference Hand, et al. (U.S. 4,817,347) and further in view of Fujihara (3,657,516).

It should be noted that each and every one of the previously pending claims under consideration and which depend from claim 1 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng, et al. in view of Hand, et al. and Fujihara, and further in view of one or more additional prior art references.

It is Applicant's contention that this action (the third non-final action), fails to establish a *prima facie* case of obviousness as to any one of the presently pending claims for the reasons hereinafter set forth.

There is no motivation to modify Cheng, et al. '854
in view of the newly cited reference Hand, et al. '347

One of the basic criteria that must be satisfied to establish a *prima facie* case of obviousness under 35 U.S.C. §103 is that there must be some suggestion or reason for modifying one reference in view of one or more other references, or knowledge

available to one having ordinary skill in the art. In the present Office Action, the Examiner's only comment directed to motivation for modifying Cheng, et al. in view of Hand, et al. is found in the last sentence commencing on page 2 of the Action, wherein it is stated, "It would have been obvious to one having ordinary skill in the art to modify Cheng's dielectric sheath 12 with a lower layer having an upper face and being bonded to the bundle of fibers as taught by Hand *in order to secure rigidity of the heating element* (emphasis added).

Referring now to Cheng, et al. (the reference to be modified), the electric heating wire applications taught in Cheng are intended for use in an electric blanket, Figs. 5 and 6 of Cheng, and a heating pad, Figs. 7A and 7B. In paragraph [0003] of Cheng, et al., an electric blanket having conventional electrical heating wires is discussed and it is stated, "The blanket embedded with round wire also generates a stiff touch which is not comfortable to people cuddled in the blanket." Hence, the inventors of Cheng et al. regard stiffness in the heating element of their invention as undesirable. The Cheng patent also repeatedly refers to the importance of *pliability* in products made in accordance with applications of the Cheng, et al. invention (see paragraphs [0017] and [0023]). Clearly, Cheng, et al. '854 teaches that it is undesirable to secure rigidity of the carbon fiber heating element 10 for the purposes for which it is intended. The provision of *pliability, not rigidity, is a primary objective of the Cheng, et al. invention.*

Cheng teaches away from the hypothetical combination proposed by the Examiner. Further, modification of Cheng, et al. to secure rigidity of the Cheng heating element, as proposed by the Examiner, will render the Cheng heating element 10 unsuitable for the purpose for which it is intended which *negates motivation* to make the proposed modification of Cheng in view of Hand.

Another object of the Cheng, et al. invention is to provide an electric heating wire which prevents fatigue in the wire caused by frequent heating and temperature variations when the wire is heated, thereby to achieve improved safety and durability of electric blankets and heating pads utilizing such heated wire. The patent to Hand, et al. '347 discloses a heated peripheral adhesive band 11 for adhesive glazing of a window panel in the airframe of an aircraft, particularly a helicopter. The heating element 14 in the heated peripheral glazing band 11 of Hand et al. is used only one time, that is when the window pane is adhered to the airframe during manufacture of the aircraft, if the window pane survives for the life of the aircraft. The heating element of Hand may be used one more time in dismounting the window pane, but only if the window pane becomes damaged and requires replacement. Certainly, one having ordinary skill in the arts with which the Cheng and Hand patents are concerned would not look to the Hand patent, which shows a heating element which may be used only once, and at most twice, for teaching as to how to avoid thermal stresses in a heating element which is subjected to frequent heating and variations in heating temperature, as, for example, in an electric blanket or a heating pad, as taught by Cheng, et al. There is no motivation to modify Cheng, et al. '845 in view of Hand, et al. '347.

<u>The teaching of Hand, et al. cannot be used to improve the invention disclosed by Cheng, et al.</u>

It appears that the Examiner may have erroneously concluded that Hand, et al. teaches that bonding a layer of thermosetting polyurethane to a heating element will impart rigidity and thereby add strength to that element. This is clearly not the case.

Referring to Hand, et al. '347, column 4, lines 41-54, the process for glazing a window panel in an airframe is disclosed. At column 4, lines 41-54, it is stated,

> When a window panel is being glazed to an aircraft, the protective layer would be removed, the panel placed in position, and current then supplied to the heating element 14 which softens the adhesive strip 16 preferentially. The spacer strip 12 provides a cushioning effect which ensures uniform contact of the adhesive band when uniform positive pressure is applied to the outside of the window panel during fitting. This pressure is maintained after the heating current has been switched off and the strip has stiffened sufficiently for the required adhesion of the window panel to the airframe.

The term "stiffened", as it is used in the patent to Hand, et al. '347, refers to viscosity of the adhesive bonding strip 16 during the glazing process and not the ability of the adhesive strip 16 to take on a substantially rigid form after it has cured. One having ordinary skill in the art would readily recognize that the term "stiffened," as it is used in the cited patent to Hand, et al., refers to adhesive material having sufficient viscosity so that it will not ooze out of the space between the window panel and the airframe, and thereby loose a substantial amount of its potential holding power while pressure is being applied to set the window panel in the frame. When the glazing operation is completed, the Hand heating element is dormant and resides between two rigid members, namely the window pane and its frame. Heating element strength is not a consideration in the patent to Hand, et al. '347. Those having ordinary skill in the arts relating to the Cheng and the Hand patents would have no motivation to combine the teachings of these two patents. There must be something in the prior art as a whole to suggest the *desirability* and, thus, the obviousness of making a hypothetical combination. This requisite desirability is absent from the proposed combination of Cheng, et al. and of Hand,, et al.

It is Applicant's contention that none of the claims presently under consideration are anticipated by the combined teachings of Cheng, et al.

(2004/0035854) as evidenced by Sughanthan, et al. (U.S. 6,639,562) in view of Hand, et al. (U.S. 4,817,347) and further in view of Fujihara (3,657,516).

The combined teachings of Cheng, et al. and Hand, et al. do not establish *prima facie* obviousness under 35 U.S.C. § 103.

It is Applicant's contention that the combined teachings of the primary reference Cheng, et al. (2004/0035854) and the secondary reference Hand, et al. (U.S. 4,817,347), considered as a whole, do not provide the requisite teachings to establish *prima facie* obviousness under 35 U.S.C. § 103.

Applicant's counsel is confused as to how the Examiner is applying the prior art, namely Cheng, et al. as evidenced by Sughanthan, et al., in view of Hand, et al. The undersigned counsel has made a reasonably, but unsuccessful, effort to obtain from the Examiner, by telephone, clarification of questions raised by this action. Since the due date for response was June 20, 2006, counsel must proceed with the preparation of this response. Accordingly, certain assumptions must be made as to how the art is being applied so that Applicant may promptly complete and file a proper response.

The portion of the Action, which Applicant's counsel finds to be confusing is found in paragraph 2, page 2 of the Action mailed March 20, 2006, wherein the Examiner states,

> Hand discloses a heated panel comprising bonded strip 13 of thermoplastic polyurethane (column 4, lines 5-15 and 26-33). It would have been obvious to one having ordinary skill in the art to modify Cheng's dielectric sheath 12 with a lower layer having an upper face and being bonded to the bundle of fibers as taught by Hand in order to secure rigidity of the heating element.

Based upon the reference to column 4, lines 26-33, Applicant's counsel can assume only that the "lower layer having an upper face and being bonded to the

bundle of fibers as taught by Hand..." is the third strip or adhesive strip 16 of Hand. The following comments are based upon that assumption.

The present action violates 35 U.S.C. § 103.

It is Applicant's contention that the present Action violates 35 U.S.C. § 103, because the subject matter of the prior art has not been considered as a whole and the differences between the subject matter of the prior art and the subject matter sought to be patented have not been properly considered as a whole to determine whether the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.

Pending independent claim 1 and claims 2-25, which depend therefrom, call for, *inter alia*, a heating element assembly having an axial elongated bundle of carbon fibers embraced by a dielectric sheath including a lower layer having an upper face bonded to a lower surface of the bundle and an upper layer having a lower faced disposed in overlying direct contacting engagement and unconnected relation to an upper surface of the bundle. The argument directed to the allowance of claims 1-26 apply with equal force to independent claims 26, 27 and 35, and the claims which depend therefrom.

At page 2, paragraph 2 of the present action, the Examiner correctly states that Cheng, et al. teaches a heating element assembly wherein upper and lower layers of a sheath 12 overlie but are in unconnected relation to upper and lower surfaces of a heating element 11.

It appears to be the Examiner's position that it would be obvious to modify Cheng, et al. by bonding *only* the upper face of the lower layer of the Cheng sheath

material and wherein the heating element is bonded or otherwise connected to both an upper layer of a sheath and a lower layer of a sheath which embraces the heating element. For convenience, and comparison, an enlargement of Figure 2 of the Hand patent is included herewith as Exhibit A.

Referring to the cited patent reference Hand, et al. '347 and Exhibit A, it is Applicant's contention that the layers 15 and 16 comprise a sheath which generally correspond to the sheath 12 of Cheng, et al. and which embraces a heating element 14. In Hand '347, at column 4, lines 30-33, it is stated, "An electrical heating element 14 is adhered to the outer face of the strip 12 by a bonding strip 15 of the same thermoplastic polyurethane."

Since the bonding strip 15 connects the heating element 14 to the spacer strip 12, it necessarily follows that the heating element 14 is connected to the bonding strip 15 (i.e. the heating element is connected to the upper layer of the sheath).

The Examiner contends that the heating element 14 is connected to the lower layer . Applicant assumes that the Examiner is referring to the layer 16.

Further referring to Hand '347, at column 4, lines 34-39, it is stated,

> A third strip 16, for example about 1 mm thick, of a thermoplastic polyurethane of lower softening temperature than the polyurethane of the bonding strips 13 and 15 is bonded to strip 15 and over the heating element which is in effect embedded in the strip 16. This strip 16 is an adhesive strip for adhesion to the airframe.

It is respectfully submitted that the first sentence of the aforesaid quotation must be read as though the words "is bonded" appear before the word "over" for the sentence beginning at line 34 and ending at line 38 to provide proper grammatical meaning.

In the paragraph from Hand, et al. quoted immediate above, it is stated that the strip 16 is an adhesive strip and that the heating element is embedded in the strip

16. In considering the disclosure in a patent reference, it is proper to consider not only the specific teachings of the reference, but also the inferences which one skilled in the art may reasonably expect to draw from the reference. *In re Preda,* 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). It is Applicant's contention that one having ordinary skill in the art would draw the inference from the Hand disclosure that the heating element 14 is adhesively bonded to the lower layer 16.

At column 4, lines 41-42 of Hand '347, there is a reference to United Kingdom patent application GB No. 2157754 A, filed April 11, 1985 by Christopher William Goeffery Hall, a co-inventor on the Hand, et al. patent. Hall is apparently the inventor of the peripheral adhesive band 11 disclosed in the patent to Hand and Hall '347. The British patent application of Hall discloses a peripheral adhesive band substantially identical to the band disclosed in Hand, et al. '347. A copy of GB 2157754 A is included herewith as Exhibit B. An enlargement of Fig. 1 from the aforesaid British patent application is also included herewith as Exhibit C. A comparison of the peripheral adhesive bands shown in Exhibits A and C will show that the bands are substantially identical.

Lines 24-44 of British patent application '754 A contain explicit statements which support Applicant's contention that the bonding layer 15 and the adhesive layer 16 of Hand, et al. '347 are each bonded to the heating element 14, as contended by Applicant.

Attention is directed particularly to lines 27-30 of the British patent application of Hall, wherein it is stated that the first bonding strip 12 is 0.5 mm thick. The bonding strip 12 shown in the British patent application of Hall corresponds to the bonding strip 15 of Hand, et al. '347. This statement is offered as evidence that the bonding strip 15, which Applicant equates to the upper layer of the sheath

formed by the layers 15 and 16 of Hand, et al. is more than a mere coating of adhesive. The 0.5mm thickness of this layer certainly indicates that the layer 15 has an existence of its own and may form the layer of the hypothetical sheath which Applicant's counsel finds to be present in the cited reference to Hand et al. '347.

A copy of U.S. patent 4,645,146 to Hall, Exhibit D and a copy of European patent application 0236045 to Hand, et al., Exhibit E, are included herewith for the record, since each of these exhibits contain evidentiary disclosure to support Applicant's contention that the upper and lower layers 15 and 16 of the cited secondary reference Hand, et al. '347 are connected to the heating element 14.

All of the claims presently under consideration call for,

> A heating element assembly comprising an axially elongated substantially flat bundle formed by a multiplicity of *continuous axially extending carbon fibers*.

Cheng, et al. '854 A1, cited in rejection of all of the claims teaches an electrical heating wire, comprising; a core *consisting of a plurality of strands of graphite fiber*.

Cheng uses the term "consists" in the specification and "consisting" in the claims in describing the core element places a definite limitation on this element which clearly distinguishes it from the corresponding heating element described in Applicant's specification and set forth in all of Applicant's claims. Specifically, Applicant's claims call for a heating element assembly comprising; an axially elongated substantially flat bundle formed by a multiplicity of *continuous axially extending carbon fibers*.

It is respectfully submitted that at the time invention sought to be patented was made, one having ordinary skill in the electrical arts generally would readily distinguish heating element formed by a multiplicity of continuous axially

extending carbon fibers (i.e. man made fibers which could be a mile or more in length) from one formed by stranded carbon fibers, that is one in which the carbon fibers are short fibers plaited or twisted about each other. Hence, Applicant's claimed structure further distinguishes over the structure shown in the patent to Cheng, et al.

It is Applicant's contention that there is no motivation or suggestion in either the reference to Cheng, et al. '854 or Fujihara (3,657,516) or in the knowledge generally available to one of ordinary skill in the art to modify Cheng, et al. in view of Fujihara, or to combine the teachings of these two references.

To justify the modification of Cheng, et al. in view of Fujihara, the Examiner argues that it would have been obvious to one having ordinary skill in the art to modify Cheng's invention to include a diameter and resistance range of carbon fiber heating element as taught by Fujihara ... in order to make the flat heating cable (the Cheng cable) more durable, but Cheng does not disclose the diameter or resistance of the carbon fibers in his heating element which renders the Examiner's argument meaningless. One cannot say that there would be a reasonable expectation of success resulting from the proposed modification because there is no basis for making a comparison. It is even possible that the proposed modification would weaken the resulting combination rendering the modified Cheng structure inferior to the original one.

For the various aforesaid reasons, a *prima facie* case for obviousness under 35 U.S.C. § 103 has not been established. Accordingly, it is respectfully submitted that all of the claims presently under consideration should be allowed.

Applicant hereby petitions for a one-month extension of time in order to file an Response to Office Action in the above-identified application. The fee of $120.00

required under 37 CFR 1.17(a) is enclosed.

If any additional extension of time for the accompanying response is required, applicant requests that this paper be considered a petition therefor.

The Commissioner is authorized to charge any fees under 37 CFR 1.17(a) to (d), which may be required to Deposit Account No. 13-0235.

Respectfully submitted,

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